M2M Communications Corporation

Agricultural Load Control Program in California Central Valley Grid

Abstract

The M2M Agricultural Load Control Program in California's Central Valley project includes the deployment of a voluntary demand response program and customer devices for agricultural customers. The program operates in the service territories of Pacific Gas & Electric and Southern California Edison. M2M is installing direct load control devices for irrigation and food processing facilities, along with enhanced communications infrastructure and energy Web portals. M2M also provides analytics and software for bidding into the California Independent System Operator (CAISO) demand response market. The project aims to reduce peak electricity demand and overall energy usage during the growing season. The project implements two-way communications and automated demand response applications to: (1) allow customers to view and manage their energy consumption at their convenience through the customer Web portal, and (2) allow M2M to manage, measure, aggregate, and verify targeted demand reduction.

At-A-Glance

Recipient: M2M Communications Corporation

State: California

NERC Region: Western Electricity Coordinating Council

Total Budget: $8,620,913

Federal Share: $2,171,710

Project Type: Advanced Metering Infrastructure and Customer Systems

Equipment

- **Customer System Communications Network**
- **Up to 3,000 Direct Load Control Devices**
- **Customer Web Portal Access for up to 3,000 Customers**

Targeted Benefits

- **Reduced Electricity Costs for Customers**
- **Reduced Costs from Equipment Failures, Distribution Line Losses, and Theft**
- **Optimized Generator Operation**
- **Deferred Investment in Generation Capacity Expansion**
- **Reduced Ancillary Service Cost**
- **Reduced Greenhouse Gas and Criteria Pollutant Emissions**

Smart Grid Features

Communications infrastructure includes two-way wireless modems for remote measurement and control of irrigation and food processing loads. CAISO peak demand events are communicated to the M2M operations center and transmitted to irrigation direct load control devices through Internet and modem networks. The wireless modems also transmit data to a customer Web interface so that they can observe electricity use changes resulting from peak demand events.

Advanced electricity service options offered through the project include a Web portal for all customers participating in M2M's agricultural demand response program. Web portals allow customers to remotely view their electricity usage, water pressure, water flow rate, and soil moisture information. Customers can set their own operating criteria for the direct load control devices to minimize the impacts of demand response events on crop health and yields. The Web portal enables customers to respond to peak demand events and more efficiently manage their electricity use and costs.

Direct load control devices deployed by the project include up to 3,000 devices for agricultural customers who agree to allow M2M to control their irrigation pumps and food processing cooling loads during peak periods. M2M aggregates the demand reductions from these devices and bids the savings into the CAISO capacity and energy markets for settlement on behalf of their customers. Customers receive rebate credits for contributing load reductions. The direct load control devices verify demand reductions via two-way communication through wireless modem networks.

M2M Communications Corporation *(continued)*

Timeline

Key Milestones	Target Dates
Direct load control device deployment begins	Q4 2009
Demand response program begins	Q2 2010
Direct load control device deployment ends	Q3 2012

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